

SPECIFICATION

COMPUTER ENCLOSURE INCORPORATING FIXING

STRUCTURES FOR FANS

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

[0001] The present invention relates to computer enclosures, and particularly to a computer enclosure which can replaceably secure different standards sized fans thereto. The invention relates to a copending application titled "COMPUTER ENCLOSURE INCORPORATING MOUNTING APPARATUS FOR DISK DRIVES", having the same applicant and the same assignee with the invention.

2. RELATED ART

[0002] A typical contemporary personal computer comprises a central processing unit (CPU) and a power supply. Heat is generated by the CPU, and resulting heated air is removed away from the CPU by an adjacent fan driven by the power supply.

[0003] However, a single fan does not always effectively dissipate large amounts of heated air generated from modern powerful CPUs. Accordingly, a second fan is often installed at an outside panel of a computer enclosure, to bring cooling air into the enclosure. The second fan is generally attached to the enclosure with screws. This conventionally requires a tool. The attachment procedure is unduly tedious and inconvenient, especially when the enclosure is small. Furthermore, other components in the enclosure are prone to be accidentally damaged during the attachment procedure.

[0004] An alternative means of attachment of a fan to a computer enclosure is shown in U.S. Pat. No. 6,215,659. A fan holder comprises four lateral spring

hooks and two longitudinal spring hooks. The enclosure defines four lateral and two longitudinal slots therein. The hooks respectively extend through the slots of the enclosure and engage with the enclosure. Thus, the fan is fastened to the enclosure.

[0005] The fan holder does not require screws. However, the fan holder necessarily occupies extra valuable space in the enclosure. In addition, the fan holder is unstandardized, in that each individual fan holder is designed for a specific computer enclosure having its own particular configuration. Once the fan holder is damaged, it is difficult to find a replacement fan holder that matches the particular computer enclosure.

[0006] Furthermore, the fan used with the fan holder generally comes in two standard sizes, 92mm and 80mm. Each fan holder is configured for either of these standard sizes. A fan holder configured for the larger standard size fan cannot be used for the smaller standard size fan, and vice versa.

[0007] Thus, a computer enclosure with holding means which solves the above-mentioned problems is strongly desired.

SUMMARY OF THE INVENTION

[0008] Accordingly, an object of the present invention is to provide a computer enclosure which readily and firmly attaches a fan to a panel thereof.

[0009] Another object of the present invention is to provide a computer enclosure which allows different standard sized fans to be replaceably secured to a panel thereof.

[0010] To achieve the above-mentioned objects, a computer enclosure in accordance with the present invention for securing a first standard sized fan or a second standard sized fan thereto, comprises a front panel and a drive bracket.

The front panel comprises an array of vents defined in a lower portion thereof, a set of first fixing structures corresponding the first standard fan and a set of second fixing structure corresponding the second standard fan around the array of vents. The drive bracket comprises a U-shaped bracket attached to an upper portion of the front panel, and a first and an opposite second side plate attached to the front panel for sandwiching the first or second fan therebetween. The first side plate forms a bridge shaped platform for abutting one side fan of the first or second fan. A tongue is formed from the second side plate by way of stamping, the tongue has a first and second pairs of projections for engaging respectively in apertures defined in the first or second an. The first fan can be attached to the front panel by the first set of fixing structure, the bridge shape platform and the first pair projections of the tongue. The second fan can be attached to the front panel by the second set of fixing structure, the bridge shape platform and the second pair projections of the tongue. Thereby, the two different standards fans can be replaceably secured to the panel of the computer enclosure.

[0011] Other objects, advantages and novel features of the present invention will be drawn from the following detailed description of a preferred embodiment of the present invention with attached drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Fig. 1 is an exploded, isometric view of a computer enclosure of the present invention, together with a first standard sized fan;

[0013] Fig. 2 is similar to Fig. 1, but viewed from another aspect;

[0014] Fig. 3 is a partly assembled view of Fig. 1;

[0015] Fig. 4 is a fully assembled view of the computer enclosure and fan of Fig. 1, viewed from another aspect;

[0016] Fig. 5 is a partly assembled view of the computer enclosure of FIG. 1, together with a second standard sized fan; and

[0017] Fig. 6 is a fully assembled view of the computer enclosure and fan of Fig. 5, viewed from another aspect.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0018] Referring to Figs. 1-6, a computer enclosure of the present invention is used to secure a first standard sized fan 40 or a second standard sized fan 50 thereto. The enclosure comprises a front panel 10, and a drive bracket 20 attached to the front panel 10.

[0019] In the preferred embodiment, the standard size of the first fan 40 is 80mm, and the standard size of the second fan 50 is 92mm. The first and second fans 40, 50 each define four through apertures 41, 51 at four corners thereof respectively.

[0020] The front panel 10 comprises an array of vents 14 defined in a lower portion thereof, a first set of fixing structures corresponding the first fan 40, and a second set of fixing structures corresponding the second fan 50. The first set of fixing structures comprises a pair of first latches 13 extending perpendicularly inwardly from the front panel 10 above and below the array of vents 14 respectively. The second set of fixing structures comprises a pair of L-shaped hooks 11 extending inwardly from the front panel 10 above the array of vents 14, and a pair of second latches 12 extending inwardly from the front panel 10 below the array of vents 14. The positions of the hooks 11 correspond to a height of the second fan 50. A distal end portion of each second latch 12 is bent slightly downwardly to form a flared end (not labeled), for convenient operation during assembly and disassembly. A plurality of aligned slots 16 is defined in a lower portion of the front panel 10, for engagement of the drive bracket 20 thereat.

[0021] The drive bracket 20 comprises a U-shaped upper bracket 21 attached to an upper portion of the front panel 10, a first side plate 22 bending and extending from a bottom plate 27 of the U-shaped bracket 21, and a second side plate 25 attached to the front panel 10 opposite from the first side plate 22. The first fan 40 or second fan 50 can thus be sandwiched between the first side plate 22 and the second side plate 25. The bottom plate 27 defines a transverse bar 28 at a rear portion of the U-shaped bracket 21. The U-shaped bracket 21 defines a fixing hole 211 in a side thereof corresponding to the second side plate 25.

[0022] It is noted that referring to FIG. 1, the side wall 212 and the bottom plate 27 of the U-shaped bracket 21, and the first side plate 22 are integrally formed from one piece metal sheet, while the side wall 213 is discrete therefrom but attached thereto to cooperate with the first side wall 212 and the bottom plate 27 to form the U-shaped upper bracket 21. On the other hand, the first side plate 22 and the second side plate 25 cooperate with the bottom plate 27 to form a lower bracket (not labeled). Clearly, the lower bracket is narrower than the upper bracket for compliance with the drives and/or other electronic components respectively disposed therein. It is noted that the second side plate 25 generally has the same width with the side wall 212 along a front-to-back direction while the first side plate 22 defines the smaller width relative to either the second side plate 25 and the side wall 212. It is because the first side plate 22 is split from the bottom plate 27 to spare material of the transverse bar 28, and can not own the whole width dimension as the side wall 212. Anyhow, this width difference between the first side plate 22 and the second side plate 25 will not jeopardize the function of the lower bracket defined among the first side plate 22, the second side plate 25 and the bottom plate 27.

[0023] The first side plate 22 inwardly forms a bridge shaped platform 23 by way of stamping. The bridge shaped platform 23 comprises a central supporting section 231, and two slant sections 230 connecting the supporting section 231 with

a main body of the first side plate 22. The supporting section 231 is for abutting one side of the first fan 40 or second fan 50. A flange 232 extends from a rear edge of the supporting section 231, parallel to the front panel 10, for fittingly abutting against the first fan 40 or second fan 50.

[0024] The second side plate 25 comprises a flange (not labeled) bent from a top edge portion thereof. A plurality of catches 252 extends from a front edge of the second side plate 25, for engaging in the slots 16 of the front panel 10. A tongue 26 is formed perpendicularly inwardly from the second side plate 25, by way of stamping. A through hole 251 is defined in the flange, corresponding to the fixing hole 211 of the U-shaped bracket 21. The tongue 26 has a pair of projections 261 and a pair of projections 262, for engaging respectively in the apertures 41 of the first fan 40 or the apertures 51 of the second fan 50.

[0025] Referring to Figs. 1-4, in assembly of the first fan 40, the first fan 40 is slid along a path formed by the pair of first latches 13 of the front panel 10 until an end of the first fan 40 contacts the supporting section 231. In this position, the flange 232 fittingly abuts against the first fan 40. Then, the second side plate 25 is attached to the front panel 10. The projections 261 of the second side plate 25 are received in corresponding apertures 41 of the first fan 40, and the catches 252 of the second side plate 25 are engaged in the slots 16 of the front panel 10. A screw (not shown) is extended through the through hole 251 of the second side plate 25 and engaged in the fixing hole 211 of the U-shaped bracket 21. The first fan 40 is thus securely attached to the front panel 10.

[0026] Referring to Figs. 5-6, in assembly of the second fan 50, the second fan 50 is pushed upward until one end thereof is engaged by the hooks 11, and a bottom end thereof is engaged by the second latches 12 via said flared ends thereof. The second fan 50 is pushed toward the first bracket 22 until an end of the second fan 50 contacts the supporting section 231. In this position, the flange 232 abuts against the second fan 50. Then, the second side plate 25 is attached to the front

panel 10. The projections 262 of the second side plate 25 are received in corresponding apertures 51 of the second fan 50, and the catches 252 of the second side plate 25 are engaged in the slots 16 of the front panel 10. A screw (not shown) is extended through the through hole 251 of the second side plate 25 and engaged in the fixing hole 211 of the U-shaped bracket 21. The second fan 50 is thus securely attached to the front panel 10. It is noted that the first latch 13, due to the properly designed contour and position thereof, will not interfere with the second fan 50 during installation.

[0027] It is understood that the invention may be embodied in other forms without departing from the spirit thereof. Thus, the present example and embodiment is to be considered in all respects as illustrative and not restrictive, and the invention is not to be limited to the details given herein.